FLAKED STONE MATERIAL FROM GGW-1

By R. V. S. Wright

Introduction

The intention of this excavation was to acquire as complete a collection of archaeological remains as possible from a sample of the deposits of the Keilor terrace. Mulvaney had carried out, and was to carry out, laborious exploratory excavations to establish the general relationship of artifacts to deposits in this terrace. Since I had an ample labour force from students of the Department of Anthropology at the University of Sydney I decided to concentrate my efforts on a limited volume of deposit. The intensive examination of this intractable deposit means that we can make a confident statement about a total industry from the Keilor terrace. Small objects in the sample excavated should be at their true proportionate frequencies compared with the larger, more readily recovered, objects.. Mulvaney's more extensive exploration is thus complemented by this intensive examination.

Designations

I named the area excavated GGW-1. This signifies Green Gully, Wright's first excavated area. To serve as a local datum point I put an aluminium tube into the ground. This point has been defined in relation to other fixed points in the area. Its level is related to the datum at the skeleton site of 64·56 feet. I used my datum in dividing the site into areas two feet square. These areas are designated by their corners closest to the datum. Thus SE16/NE2 designates the area whose nearest corner is 16 ft SE. and two feet NE. of the datum. The datum also served for designating levels, which can be related to those elsewhere in the Green Gully excavations.

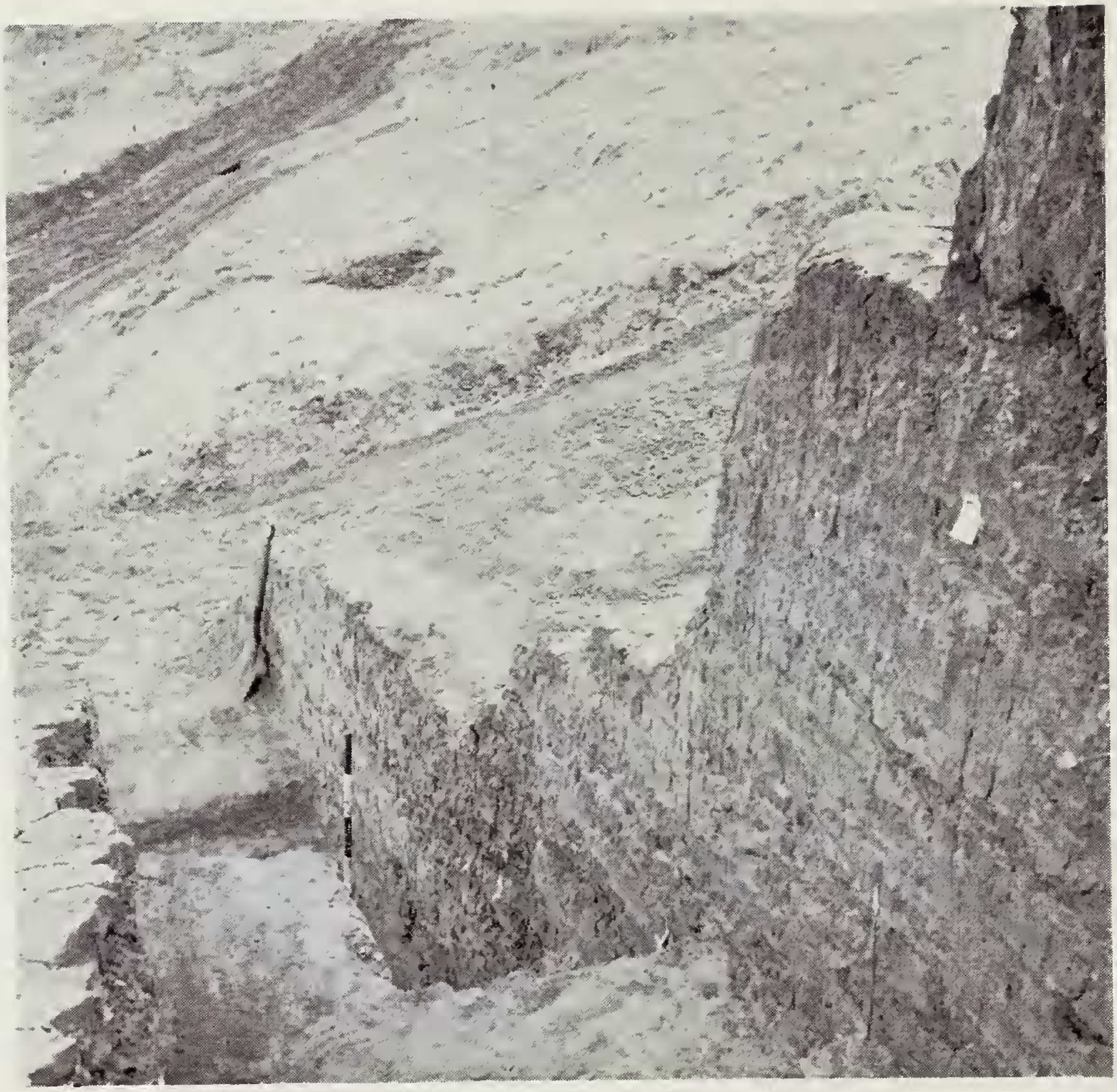
Methods of Excavation

The deposit was divided into horizontal spits six inches thick. The top and bottom limits of each spit were kept the same over the whole excavation. Given the supposed origin of the sediments, this method presumably provides the best reconstruction of chronology. However, I could see no visible stratification in the sediments to provide a check on this assumption. Although the spits are constant in elevation they were not excavated in one operation over the trenches. The site was divided into areas two feet square and the contents from each spit within a particular area were kept separate. Three-dimensionally, the site can thus be regarded as a series of progressively excavated columns.

A single spit from a single area I have called a *unit* of excavation. This is the portion of soil on the site from which the contents have been bagged as one. A unit is thus two feet square by six inches deep, making a volume of 2 cu. ft. It is designated horizontally and vertically, e.g. SE6/NE0—Spit 5. Artifacts from this excavation cannot be more precisely located than by these units of soil from which they were removed.

I ensured a constant level for spits by using a level and staff. Plumb-bobs were used to obtain vertical walls for each cutting. This means that the volumes of the units are reasonably constant and the lower units are not reduced in volume by walls sloping inwards.

The deposit was compact and hard when dug, readily fracturing into large lumps



on excavation. To prevent damage to the edges of flaked stone artifacts by scraping with a trowel I tried to remove the deposit in lumps as large as possible. After removal these were carefully crushed in a plastic basin before being sieved. All soil was sieved through a quarter inch square mesh.

TABLE 1

SE28 /NE0	SE26 /NE0	SE24 /NE0	SE22 /NE0	SE20 /NE0	SE18 /NE0	SE16 /NE0		SE8 /NE0	SE6 /NE0
SE28 /NE2	SE26 /NE2	SE24 /NE2	SE22 /NE2	SE20 /NE2	SE18 /NE2	SE16 /NE2		SE8 /NE2	SE6 /NE2

TABLE 2

The reduced levels are the same as for Mulvaney's excavations. Wright's spit numbers do not coincide with Mulvaney's

Spit No.	Reduced Level
1.	61 ft 0 in.-60 ft 6 in.
2.	60 ft 6 in.-60 ft 0 in.
3.	60 ft 0 in.-59 ft 6 in.
4.	59 ft 6 in.-59 ft 0 in.
5.	59 ft 0 in.-58 ft 6 in.
6.	58 ft 6 in.-58 ft 0 in.
7.	58 ft 0 in.-57 ft 6 in.
8.	57 ft 6 in.-57 ft 0 in.
9.	57 ft 0 in.-56 ft 6 in.
10.	56 ft 6 in.-56 ft 0 in.
11.	56 ft 0 in.-55 ft 6 in.
12.	55 ft 6 in.-55 ft 0 in.

A mechanical excavator had previously removed some two or three feet of soil from above the area I excavated. This work had left as a slope the undisturbed surface on which I started excavating. Spits 1 to 4 tended to be incomplete over the site and their degree of incompleteness varied. Spits 1 and 2 scarcely existed; Spit 3 had been largely removed but in some units up the slope (NE0 units) more than half was left. Spit 4 was nearly intact except for a few downhill units where up to two thirds had been removed. Spit 5 was complete, as were all spits below. Before starting to excavate the spits, I removed the loose debris from the surface of this slope.

Correction Factors for Contents

By computing the proportion of soil remaining in incomplete units it has been possible in some cases to apply correction factors so as to estimate better the contents before disturbance. Some uses of this correction factor occur below. Not too much reliance should be placed on the precise values of the corrected figures. Nevertheless they must be in all instances closer to reality than the actual figures. Where proportions of things actually recovered within each unit are discussed, the corrected figures are irrelevant and the actual figures have been used.

Trial Sounding

The area GGW-1 was selected because of the quantity of flakes eroding out of the soil on the artificially exposed slope, presumed to be sediments of the Keilor terrace in which the burial had taken place. The first columns excavated were furthest from the datum point. They formed a square 4 × 4 ft and contained areas SE26/NE0, SE26/NE2, SE28/NE0 and SE28/NE2. I excavated these to a depth of nine feet. This trial sounding showed that artifacts were concentrated near the top and that the deposit could be assumed to be unrewarding below Spit 7. Spits 9 to 11 had no flaked stone, Spit 12 had 3 pieces, and Spits 13 to 19 (19 was the lowest spit excavated) had no flaked stone.

Since a prime purpose of my work was to obtain a comprehensive stone industry I did not excavate below Spit 7 when extending the excavation.

TABLE 3

Spit 1	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spit 2	3	4	1	-	-	-	-	25	27	3	4	1	-	-	-	-	25	27
	2	2	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-
Spit 3	20	30	46	23	24	49	52	25	34	20	33	64	48	84	142	151	38	48
	6	7	4	-	-	-	-	18	7	12	13	25	-	-	-	-	18	65
Spit 4	46	45	46	40	26	17	3	9	11	46	45	46	44	29	19	3	9	11
	50	67	49	22	13	28	26	11	23	55	67	64	59	35	78	65	18	35
Spit 5	17	13	14	11	6	12	11	1	5	17	13	14	11	6	12	11	1	5
	24	37	19	19	11	6	29	3	3	24	37	19	23	13	7	29	3	3
Spit 6	15	17	13	16	19	1	4	12	8	15	17	13	16	19	1	4	12	8
	9	4	6	2	10	2	3	3	2	9	4	6	2	10	2	3	3	2
Spit 7	2	5	1	2	2	0	0	1	0	2	5	1	2	2	0	0	1	0
	7	4	2	2	4	1	2	1	0	7	4	2	2	4	1	2	1	0
Spit 8	2	1	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-
	4	5	-	-	-	-	-	-	-	4	5	-	-	-	-	-	-	-
Spit 12	0	0	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-
	1	3	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-	-

Distribution of pieces of flaked stone by units. For each spit a miniature plan of the site has been drawn and figures entered for each area. Designations of areas can be worked out from Fig. 1. The totals for each spit are given in Fig. 4. A dash means either no deposit was present (i.e. Spits 1-3) or the deposit was there but not excavated (i.e. Spits 8 and 12). A nought means the unit was excavated but contained no flakes.

As noted in the comments on Tables 3 and 4, the pieces of flaked stone at GGW-1 reach a peak in Spit 3 at R.L. c. 59 ft 9 in. Below R.L. 59 ft 3 in. the fall-off is marked. This pattern mirrors well that presented by Mulvaney in his Table 3. This correspondence is confirmed when we consider two further categories—pieces of basalt and the bones. Mulvaney observed intensive occupation at R.L. 60 ft in his Trenches F and G. Besides the concentration of flaked stone, there were concentrations of broken pieces of basalt and of bones.

At GGW-1 the pieces of basalt were counted and occur as follows for corrected figures: 3 (139), 4 (129), 5 (19), 6 (21), 7 (5). The pieces varied in size, the largest being a complete boulder weighing 18 lb. in Spit 4.

At GGW-1 fragmented bones, while reaching a peak at R.L. 59 ft 3 in., do not show such a clear trend as the basalt does. There are clearly two concentrations separated by a relatively barren level. Corrected figures are: 3 (163), 4 (344), 5 (26), 6 (198), 7 (48).

Raw Materials

Using the criterion of flaking characteristics, the raw materials can be readily divided into two rock types:

1. 'Quartzite', etc. (including 'chert') homogeneous with few irregularities in its structure to obstruct flaking intentions. Small to large flakes were produced.
2. 'Quartz' crystalline, with many irregularities in its structure to affect flaking intentions. Only relatively small flakes were produced.

There are changes in the proportions of these two materials through the spits.

TABLE 5

Spits	Total flaked pieces	Quartz	Quartzite etc.	% Quartz to total of spit	% Quartzite etc. to total of spit
2.	64	2	62	3%	97%
3.	345	79	266	23%	77%
4.	532	122	410	23%	77%
5.	241	85	156	35%	65%
6.	146	110	36	75%	25%
7.	36	18	18	50%	50%
	1,364	416	948		

Total of Quartz as % of total flakes = 31%
Total of Quartzite, etc. as % of total flakes = 69%

Sizes and Shapes of Flakes

To assess size and shape observations were made on the contents of areas SE26/NE 0 & 2, SE28/Ne 0 & 2. 409 flaked pieces, both broken and complete, were measured. About 55 per cent are below 2 cm in maximum dimension. 86 per cent are below 3 cm. Only between 1 per cent and 2 per cent are 5 cm or more. It is thus not a collection with a conspicuously large component. Of these 409 pieces 71 are complete flakes. Breadth as a percentage of oriented length approximates a normal distribution with a mean of 101·4 per cent and a standard deviation of 24·6 per cent. Thus the flakes tend to be of equal length and breadth and no special 'blade' grouping occurs.

State of Preservation

The flake scars on the artifacts are not abraded along the separating ridges. It thus looks as though the artifacts are *in situ* in the deposit.

TABLE 4

Spits	Actual totals for spits		Corrected totals for spits
1	1		>1
2	64		>64
3	345	most of deposit already removed	>761
4	532	73% deposit left	728
5	241	97% deposit left	248
6	146	all deposit left	146
7	36	all deposit left	36
8	12	only 4 areas dug	12
12	4	only 4 areas dug	4
	1,381		>2,000

Tables 3 and 4 show:

1. The actual number of pieces of flaked stone recovered in Spit 3 is less than in Spit 4. However, the corrected figures show that Spit 3 is richer. Whether the increase continues upwards into Spits 2 and 1 it is not possible to say.
2. From Spit 3 downwards there is a progressive decrease in the numbers of pieces present.
3. In each Spit the pieces are not evenly distributed horizontally, but are patchy. Sometimes there are marked discrepancies between adjacent units. This is most noticeable in Spit 4 SE16/NE0 and SE16/NE2 where the discrepant figures are exaggerated by correction to 3 and 65 pieces respectively. It is worth noting that there are big discrepancies in Spits where no corrections had to be made, e.g. Spit 6 SE18/NE0 (1 piece) and SE20/NE0 (19 pieces).

Density of Pieces of Flaked Stone

In no Spit would I call the artifacts plentiful:

Spit 4.	1 artifact per	85 cu. ins.
Spit 5.	1 artifact per	251 cu. ins.
Spit 6.	1 artifact per	426 cu. ins.
Spit 7.	1 artifact per	1,728 cu. ins.

The Spits are six inches deep. This means that to recover one artifact we could expect to dig areas approximately as follows:

Spit 4. 4 × 4 in.	Spit 5. 6 × 6 in.
Spit 6. 8 × 8 in.	Spit 7. 1 ft 5 in. × 1 ft 5 in.

This general paucity of pieces of flaked stone, coupled with hardness of the deposit, made the area hard to exploit. I felt that it was worthwhile to systematically crush the deposit before sieving, laborious though this was. Any bias towards picking out the larger pieces of flaked stone was thus reduced.

Correlation between GGW-1 and Other Excavations

Since all the deposit excavated at GGW-1 is part of the Keilor Terrace as determined by J. M. Bowler, its contents should be comparable with material recovered from similar levels elsewhere in the terrace. When levels are correlated, there are certain discrepancies in the nature of the collected artifacts from GGW-1 and Mulvaney's excavations. These are discussed elsewhere in this report. Of course stratigraphical correlations between disconnected areas at Green Gully are primarily problems of sedimentology. I here wish to draw attention to three observations relating to the humanly introduced material in GGW-1.

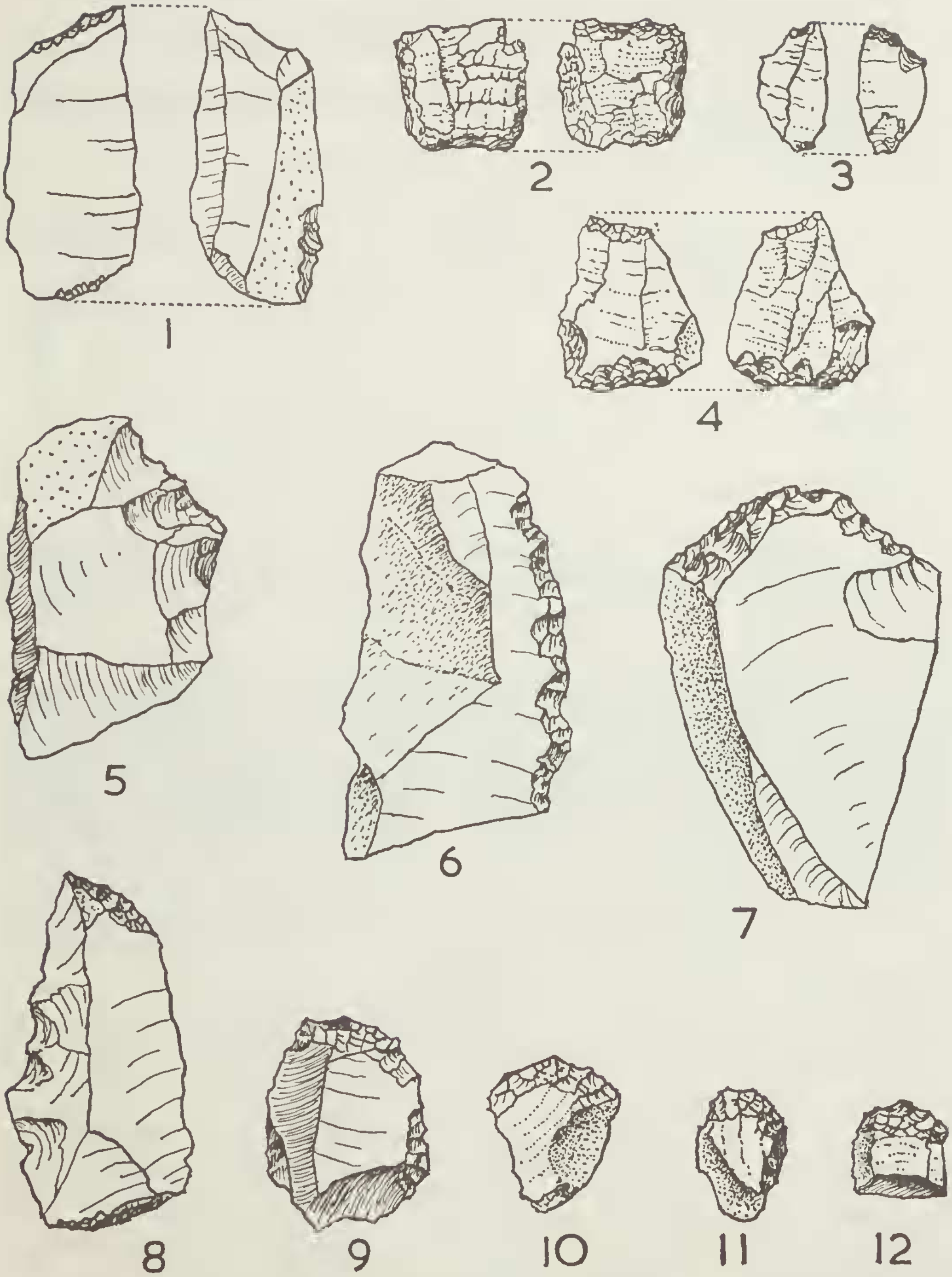


Fig. 1—1 Fabricator (Spit 8), 2 Fabricator (Spit 4), 3 Fabricator (Spit 6), 4 Fabricator (Spit 6), 5 Large nosed scraper (Spit 4), 6 Large scraper (Spit 4), 7 Large scraper (Spit 6), 8 Large scraper (Spit 3), 9 Large scraper (Spit 4), 10 Thumb-nail scraper (Spit 6), 11 Thumb-nail scraper (Spit 3), 12 Thumb-nail scraper (Spit 6). All natural size.

Secondary Work

The secondary work on primary flakes was produced by flaking alone. No grinding is present. Secondary flaking is present in the Spits as shown in Table 6.

TABLE 6

Spits	Actual No. pieces with secondary flaking	Corrected No. pieces with secondary flaking	Flakes with secondary flaking within a Spit
1.	0	—	—
2.	1	>1	1·6%
3.	20	>44	5·8%
4.	28	38	5·3%
5.	15	15	6·2%
6.	18	18	12·3%
7.	1	1	2·8%
8.	2	2	16·7%
	85	>119	

% of total secondarily flaked to total flaked = 6·2%

Comments on Table 6:

1. The percentage of Spit 8 may be unreliable because of the small number of flakes recovered.
2. Spits 3 and 4 yielded the greatest number of pieces with secondary flaking.
3. If Spit 8 is ignored, Spit 6 has the highest proportion of flakes with secondary flaking. However its actual yield is low.
4. The low percentage of Spit 2 is presumably reliable and shows an interesting scarcity of secondary flaking.
5. The proportion of secondary flaking on the site as a whole is ordinary for a stone industry.
6. None of the flakes counted as having secondary flaking could reasonably be classed as flakes used as cores. In fact no cores at all were found.

TABLE 7

Raw Material of Secondary Flaking

Spits	No. Quartz	No. Quartzite etc.	Quartz within Spit	Quartzite etc. within Spit
2.	0	1	0%	100%
3.	8	12	40%	60%
4.	4	24	14%	86%
5.	5	10	33%	67%
6.	14	4	78%	22%
7.	0	1	0%	100%
	31	52		

Total Quartz with secondary flaking as % of total secondarily flaked = 37%
Total Quartzite etc. with secondary flaking as % of total secondarily flaked = 63%

Comments on Table 7:

1. The overall percentage of quartz used for secondary flaking correlates well with its percentage occurrence overall (Table 5).

2. In Spit 3 quartz is relatively more important for secondary flaking than its occurrence overall suggests. In Spit 4 it is less important.
3. The big increase in its use for secondary flaking in Spit 6 correlates with its increased use overall.
4. Its apparent lack of use in Spit 7 can be discounted because only one flake with secondary working was found.

I have divided the flakes with secondary flaking as follows:

TABLE 8

Spits	Large scraper	Thumb-nail scraper	Fabricator	Misc. secondarily flaked
1.	0	0	0	0
2.	0	0	0	1
3.	2	5	3	10
4.	5	2	6	15
5.	2	2	3	8
6.	3	9	3	3
7.	0	0	0	1
8.	0	0	1	1
	12	18	16	39

These types are fairly evenly distributed through the deposit, both horizontally and vertically. To show this, columns NE0 and NE2 have been combined along the whole area excavated. In this way the schematic section of Table 9 has been produced.

An examination of this distribution suggests that there are no differences either laterally or vertically. Actual numbers are of course low. To test whether there are sufficient types to make a statement about homogeneity two chi^2 tests were made using Spits 3-6 inclusive. The first is a test for a significant difference between the five right hand and the four left hand columns of Table 9. The second is a test for Spits 3 and 4 against Spits 5 and 6. Yate's correction was made for both. The results are as follows:

	4 lft. Cols.	5 rt. Cols.
Large Scraper	5	7
Micro Scraper	9	9
Fabricator	4	11

Chi$^2 = 1 \cdot 02$

d.f. $= 2$

probability is greater than $0 \cdot 3$

	Large Scraper	Micro Scraper	Fabricator
Spits 3 and 4	7	7	9
Spits 5 and 6	5	11	6

Chi$^2 = 0 \cdot 83$
d.f. $= 2$
probability is greater than $0 \cdot 5$

Thus, in terms of the categories listed, there is good reason for thinking of the site as homogeneous. The observed differences in Table 9 could well be due to chance.

TABLE 9

'' = large scraper   + = micro scraper   ǂ = fabricator

Spits									
3				+			'' ǂ	+ + ǂ	'' + +
4	'' '' ǂ	ǂ	+ ǂ		ǂ	'' '' ''	ǂ	ǂ	+
5	''						'' ǂ ǂ ǂ	+	+
6	'' + ǂ +	+ + + +	''	+	+ +	''		ǂ ǂ	
7									
8	ǂ								

Discussion of Types

Large scrapers (Fig. 1, Nos. 5-9). These vary in size and form. Secondary flaking can form a convex edge, e.g. Nos. 6 and 7. No. 5 is the only scraper where a nose seems to have been deliberately created. All 12 are made of 'quartzite'.

Micro scrapers (Fig. 1, Nos. 10-12). 16 of the 18 are of quartz. The intention of the artisan was to make a convex scraper edge shaped like a thumbnail. Thumbnail scrapers of the Bondaian industries of coastal N.S.W. regularly have this sort of edge placed opposite the striking platform of a small flake. The GGW-1 specimens do not show this relationship of edge to striking platform. In fact the tiny pieces of quartz on which they are made rarely show striking platforms. It seems then that these micro scrapers were most frequently made on pieces broken off quartz flakes. That the micro scrapers are not merely the small-sized end of the range of large scrapers is shown in Table 10, where both types have been combined.

TABLE 10

Max. dimension of scrapers in cm	Frequency
7·0-7·5	0
6·5-7·0	2
6·0-6·5	0
5·5-6·0	2
5·0-5·5	1
4·5-5·0	2
4·0-4·5	2
3·5-4·0	2
3·0-3·5	1
2·5-3·0	3
2·0-2·5	10
1·5-2·0	5
1·0-1·5	0
	30

(a) the lengths of the two worked edges.
(b) distance between the two opposed worked edges and the average lengths of the two worked edges.
(c) distance between the two opposed worked edges and thickness.
(d) average length of the two opposed worked edges and thickness.

The results were:

(a) r = +0·64. Significant at the 1% level
(b) r = +0·38. Not significant at the 5% level
(c) r = —0·39. Not significant at the 5% level
(d) r = +0·39. Not significant at the 5% level.

Thus in terms of these tests the only confident conclusion we can come to about correlations is that as one worked edge increases in length so does the other. I am surprised at the evidence for weakness in the other correlations. In particular it appears unlikely that as fabricators get longer they also get thicker. I should stress that these results apply to the fabricators from Lapstone Creek and are not necessarily applicable to those from other sites.

Some other observations

	Unbroken	*Broken*
GGW-1	6 (46%)	7 (54%)
CAPERTEE 3	23 (74%)	8 (26%)
LAPSTONE CREEK	80 (83%)	17 (18%)

	Quartz	*Other rock*
GGW-1	7 (54%)	6 (46%)
CAPERTEE 3	15 (48%)	16 (52%)
LAPSTONE CREEK	43 (44%)	54 (56%)

	1 Pr. Opposed Edges	*2 Prs. Opposed Edges*
GGW-1	12 (92%)	1 (8%)
CAPERTEE 3	28 (90%)	3 (10%)
LAPSTONE CREEK	59 (65%)	32 (35%)

	Convex Edge	*St.Edge*	*Concave Edge*
GGW-1	6 (38%)	4 (25%)	6 (38%)
CAPERTEE 3	15 (37%)	12 (29%)	14 (34%)
LAPSTONE CREEK	77 (46%)	58 (35%)	32 (19%)

This last series of observations, though somewhat impressionistic in the allocation of approximately straight edges, should have shown a drastic incongruity in one of the three sites, if it existed. There are further observations and comparisons that could be made. However, on the basis of those above I see no evidence to support a theory that the fabricators from GGW-1 are a different type of object from those in E. New South Wales.

History of Recognition in Australia

The earliest reference to a fabricator seems to be Thorpe (1931, p. 286, Fig. 10). He calls this a 'button flake'. The type is not discussed but the detail in his photograph is adequate to interpret it as a fabricator with two pairs of opposed edges. Towle (1935, 120) gives a fairly full description, '. . . usually not more than one inch across, and somewhat rectangular or square in form . . . chipped to a working edge from both sides'. He refers to their name of *button flake* but also

Intuitive sorting of the specimens used in Table 10 resulted in my setting 3 cm as the boundary between the two types of scrapers. The micro scrapers show a strong mode. The peaked form of the distribution indicates that there was a tight restriction on their acceptable size. By contrast the large scrapers show no defined mode. This, coupled with their variability in form, suggest that either no good type is present in this industry, or, as seems more likely, the sample from GGW-1 is too small for a pattern or patterns of working to be discerned. I have examined Mulvaney's large scrapers and consider that mine represent the same sorts of implements as his.

Fabricators

(Fig. 1, Nos. 1-4). Otherwise known as *outils écaillés*. Essentially, fabricators show scaled flaking on opposed edges, the same edges being battered to varying degrees. Flaking is usually bifacial and normally only one pair of opposed edges is worked in this fashion. However, occasionally four edges are worked and these two opposed pairs give a final quadrangular form to the object, e.g. No. 2.

Although I had originally taken the identification of fabricators at GGW-1 for granted, I felt after discussion with Mulvaney and others that some comparative work would be an advantage. My original impression remains unaltered that the Green Gully fabricators look like those from coastal New South Wales in range of size and form. I can suggest no function for these objects derived from the other material excavated at GGW-1.

The specimens used from sites other than GGW-1 were identified by myself from the respective collections. My inclusion of a piece of flaked stone into the class rested on the identification of opposed working edges showing scaling and crushing. In examining the collections from Capertee and Lapstone Creek in the Australian Museum, Sydney, it was evident to me that McCarthy and I are very close in our basic diagnosis. I cannot however pursue the discrete nature of his subdivisions.

Some measurements

Distance between two opposed worked edges

GGW-1	15 opposed edges	Mean = 2·5 cm, s.d. 0·7 cm
GYMEA	81 opposed edges	Mean = 2·0 cm, s.d. 0·5 cm
CAPERTEE Site 3	32 opposed edges	Mean = 2·5 cm, s.d. 0·7 cm
LAPSTONE CREEK	118 opposed edges	Mean = 2·3 cm, s.d. 0·6 cm

Length along each worked edge

GGW-1	17 edges	Mean = 1·6 cm, s.d. 0·4 cm
CAPERTEE Site 3	49 edges	Mean = 1·4 cm, s.d. 0·6 cm
LAPSTONE CREEK	224 edges	Mean = 1·3 cm, s.d. 0·7 cm

Thickness (estimated by the smallest opening of calipers through which the fabricator can be fitted)

GGW-1	9 specimens	Mean = 0·9 cm, s.d. 0·2 cm
CAPERTEE Site 3	25 specimens	Mean = 1·0 cm, s.d. 0·4 cm
LAPSTONE CREEK	85 specimens	Mean = 0·8 cm, s.d. 0·3 cm

Apparent discrepancies in the frequencies for individual sites is due to breakage, which affects the suitability of a specimen for some measurements but not for others.

I did some superficial studies of correlation between measured attributes. For this I took a random sample of 15 fabricators from Lapstone Creek which were unbroken and had one pair of opposed edges. I tested for correlation between:

refers to them as scrapers. He suggests their suitability as gouges or gravers. F. D. McCarthy, in a series of articles on stone implements, describes his notion of a fabricator in detail. He first uses the term itself (1941, p. 263) in a general sense, including it within the class *hammerstones*. However, he says, 'Another type of fabricator is a flake which bears a slightly concave and battered edge, due to its use'. Two years later McCarthy (1943, p. 130) makes a comparison between what he calls 'flake fabricators' (*outils écaillés*), hitherto termed 'button flakes', and specimens from South Africa. He suggests that since in N.S.W. they are associated on the coastal dune sites with elouera and bondi points, flake fabricators may have been used for putting the backing on these implements. He goes on to give a detailed description of their characteristics and range of variation. More information about fabricators is given in McCarthy (1943, pp. 201 and 207), McCarthy and Davidson (1943, p. 221), McCarthy, Brammel and Noone (1946, p. 34 and Figs 101-102).

In the last report they are referred to as 'fabricators and trimming stones'. The allusion to their function as backing implements is analysed further by McCarthy (1948) in his report on the excavations at Lapstone Creek. An examination of his tables on pp. 11-12 shows that there were merely 11 flake fabricators of all types in the Bondaian, whereas 105 occurred in the Eloueran. McCarthy discusses the importance of this discrepancy (1948, p. 21) as it relates to possible function. He points out that it is unreasonable now to interpret flake fabricators as trimmers of Bondi points and suggests that they might have been used for retouching the working edges of elouera. Though he alludes to this discrepancy in his discussion of function mentioned above, he does not refer to fabricators when discussing the general characteristics of the Eloueran industry (1948, p. 18) except to mention 'chisels' in his microlithic assemblage. Nor does he (1948, p. 22) make enough of the preponderance of fabricators in the Eloueran when generally comparing his Bondaian and Eloueran industries. In drawing attention to this I am to a certain extent being 'wise after the event'. Hume (1965) showed that at a rock-shelter near Sassafras the frequency of fabricators rose near the top of the deposit as the Bondi Points declined. The parallel between the two sites escaped Hume.

So far we have been dealing with assemblages where fabricators occur with artifacts that we associate with a relatively late stage of Australian prehistory. Site 1 at Capertee (McCarthy 1964) confirms this attribution. The fabricators are restricted to the Bondaian and do not occur in the underlying Capertian. However, at Site 3 the situation is not so simple. In his discussion of Layers 6-11 from this site, McCarthy (1964, p. 225) describes fabricators from his Capertian industry, i.e. from levels below those containing Bondaian elements. Radiocarbon dates V-18 and V-34 show that these are between 3·5 and 7·5 thousand years old. Their pre-Bondaian associations are interesting, particularly in the light of Green Gully. McCarthy himself sees fabricators as characteristic of the Capertian (1964, p. 238).

In summary, it appears that in E. New South Wales a type of object with distinctive formal characteristics has been recognized for the past 30-40 years. In the literature there are offered various names and interpretations, but the existence of an actual type does not seem to have been disputed. That their recognition was not peculiar to N.S.W. is evidenced by Campbell and Noone (1943a, p. 297), who describe and illustrate 'punches, chisels and battered pieces', drawing attention to the parallel with the *pièces esquillées* of European Upper Palaeolithic sites. See also Campbell and Noone (1943b, p. 382).

Recognition Outside Australia. I have not surveyed the archaeological literature of the world for a bibliography of the fabricator. Two references are however worth mentioning. McCarthy suggested a functional linkage between fabricators and other aspects of associated technology. Semenov (1964, pp. 148-149) proposes a relationship of a different kind for Upper Palaeolithic sites in E. Europe. He discusses what sort of tool might have been used to make a continuous circumferential notch in a mammoth tusk prior to snapping. 'It is probable that flakes and blades were used as chisels and gouges. Such specialized tools (*pièces écaillés*) have been found on upper palaeolithic sites, consisting of flakes and even blades with wear facets on both faces. The facets as a rule have a wavy surface with sharp short flaking line and commonly a steep fracture. The character of the facets indicates that they arose not from pressure retouch but by direct blows into the flake in a vertical position on a hard base, and the facets are best regarded as signs of use, not as trimming. There are grounds for considering such flakes and blades as chisels or gouges for working bone and probably wood.' An illustration of reconstructed technique (1964, Fig. 74, 7) shows what is in form clearly a fabricator. Some work I did myself on hard wood shows such an object is readily produced by vertical blows.

The other relevant reference is that of Van Riet Lowe (1946). As well as referring vaguely to possible functions, he also makes comments on the cultural significance of '*outils écaillés*'. Van Riet Lowe too makes the point that the objects were made by a 'bi-polar technique' (1946, p. 241). The piece to be flaked was held vertically on an anvil and struck so that flakes were simultaneously removed from both ends and bifacially. He calls them 'chisels' and, where they have 'secondary trimming', 'scrapers'. Though mentioning their function, he stresses the bi-polar technique of manufacture as the diagnostic trait. They are said to be distributed in the later Stone Age of S. Africa and in the lowest levels of Choukoutien. Breuil told him that they were found in the Aurignacian and Mesolithic of France. 'The bi-polar technique is thus seen to be of very widespread occurrence. It is a manner of stone-fracture and stone-shaping common to many cultures and climes and not exclusively associated with any particular stone culture or time' (Van Riet Lowe 1946, p. 242).

The facts on geographical and temporal distribution seem unquestionable. However, I dispute one implication. I infer from Van Riet Lowe's discussion that he considers fabricators of no significance in matters of cultural tradition and diffusion. Certainly the frequency of their occurrence reduces their diagnostic value. Yet one must remember that they are *not* found in large numbers of industries. Furthermore, the circumstances of their presence and absence do not seem to be entirely random and sporadic, either geographically or temporally. If we couple this with the theoretical unlikelihood of any artisan's choice in stone flaking procedure being free of cultural control, it seems that Van Riet Lowe has said nothing that could not be said of a multitude of stone flaking procedures and artifacts, e.g., pressure flaking, side scrapers. Possibly I have over-strained Van Riet Lowe's account to make a point, but nevertheless the possible implication needs to be dealt with.

In the Australian context, therefore, I conclude by suggesting that the cultural significance of fabricators should not be discounted merely because their form is specific and their method of production readily understood. If we were to use these criteria for rejection, many other modes of flaking and types of implements would have to be called into question. This would be perhaps not a bad thing. At this stage of our knowledge what I want to deflect is special pleading in the case of fabricators.

Miscellaneous Secondarily Flaked. These consist of pieces in which I can see no significance or pattern in the secondary flaking. This is either because it is so limited or because the pieces are too broken up. The majority of the broken pieces seem to be fragments of large scrapers.